

# WWI00

## World War One Hundred

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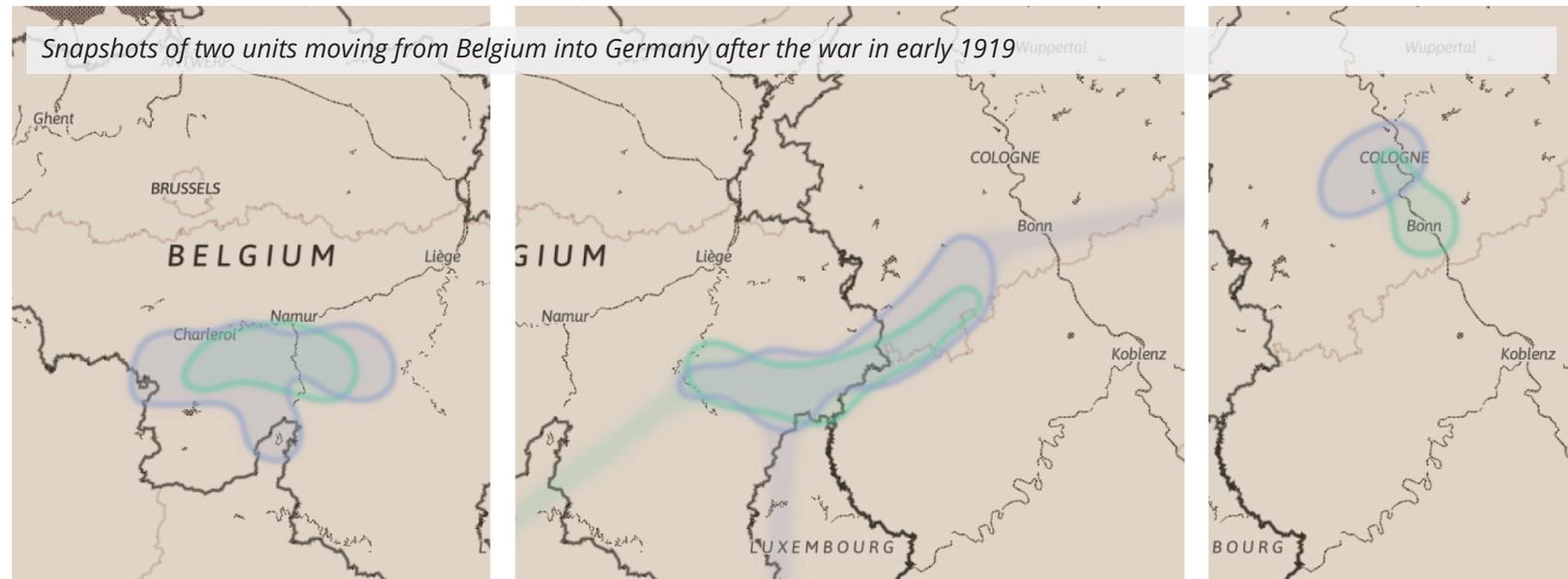
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A hundred years ago, in November 1918, the First World War (WWI) came to an end. The National Archives (UK) preserved 1.5 million pages of hand-written diaries, documenting the story of the British Army and its units on the Western Front during the war. Since 2014, “citizen historians” annotate and tag scans of those diaries on the crowdsourcing platform Operation War Diary ([1], OWD). This process generates extensive time-series data about military units including their location, military activities, casualties, everyday army life, the names of unit members and weather information. However, this process also introduces uncertainty on many levels due to missing records, misspellings, unreadable parts, lost diaries, the reliability of workers, and even through post-processing of the gathered data (e.g., georeferencing place names).

Instead of giving the illusion that the data is complete and clean, we leverage this uncertainty in the visualization we designed and developed to produce a more “organic” view of a unit’s movement



over time, with the intent to convey the notion that a unit represents human beings.

Besides the spatiotemporal movement of UK’s military units, the exhibit shows activities and day-to-day life on the Western Front during WWI. It aims to illustrate how soldiers spent their time by contrasting fighting and non-fighting activities. The OWD data show that the balance between time spent in the trenches and time spent behind the trenches are not aligned with our common beliefs about war [2]. Revealing “life behind the trenches” to the general public might help to convey the more humane aspect of the war and clarify that a lot of time was not spent fighting in the trenches.

Our piece is based on what we call GeoBlob: an abstract representation of moving entities on a map with uncertain positions. Instead of showing a unit at a given point in time, GeoBlobs convey an unordered estimation of the possible locations over a temporal window using enclosed shapes, or blobs. To this end, we

apply heuristics to weigh each location within the temporal window. Then, at the presentation stage, it is possible to specify dynamically which sets of locations form the GeoBlobs. GeoBlobs leverage the uncertainty in the data to produce an “organic” view of a moving unit on a map over time, in contrast to the visual certainty conveyed by crisp line/dot visualizations. GeoBlobs also suffer less from scalability issues, while line/dot visualizations become cluttered when the number of data points is large.

We submitted a five-minute talk about this topic to the Information+ conference 2018, which is co-located with IEEE VIS 2018. With Berlin as the location in mind, we believe the exhibition and talk will be of interest to the overlapping audiences, but also the more general, local public.

### Data and Identities

Experts have collected historical information in analog forms throughout history. Today, modern technology, such as applications, devices or sensors, change the

ways of collecting massive amounts of historical data entirely. Modern techniques now allow us to transform such analog information into digital data (as described above), making more and more data available in the Digital Humanities. In the case of OWD data, the digitized and qualified hand-written diaries (OWD data) provide an interface to otherwise buried information. This data is an unprecedented source of information that makes it possible to look at WWI through the lens of well-structured and rather exhaustive war diaries, thus provide new historical perspectives we can perhaps better relate to on a personal level.

History, or past events in general, influences our cultural identity in manifold ways. Both World Wars greatly influenced how we live together in Europe, shaping our collective as well as our personal identities. This exhibit is not intended to communicate battles, victories or defeats of WWI only. Instead, it aims at communicating a sense of the day-to-day life in the war zone. Communicating the OWD data as a whole, including fighting and

non-fighting activities, we aim at bringing to light aspects of war that can contribute to the better understanding of Europe's collective past. In the light of the current political climate, we think that it is important to highlight our collective memory, rather than a silo national mentality, that may help young generations to understand current developments.

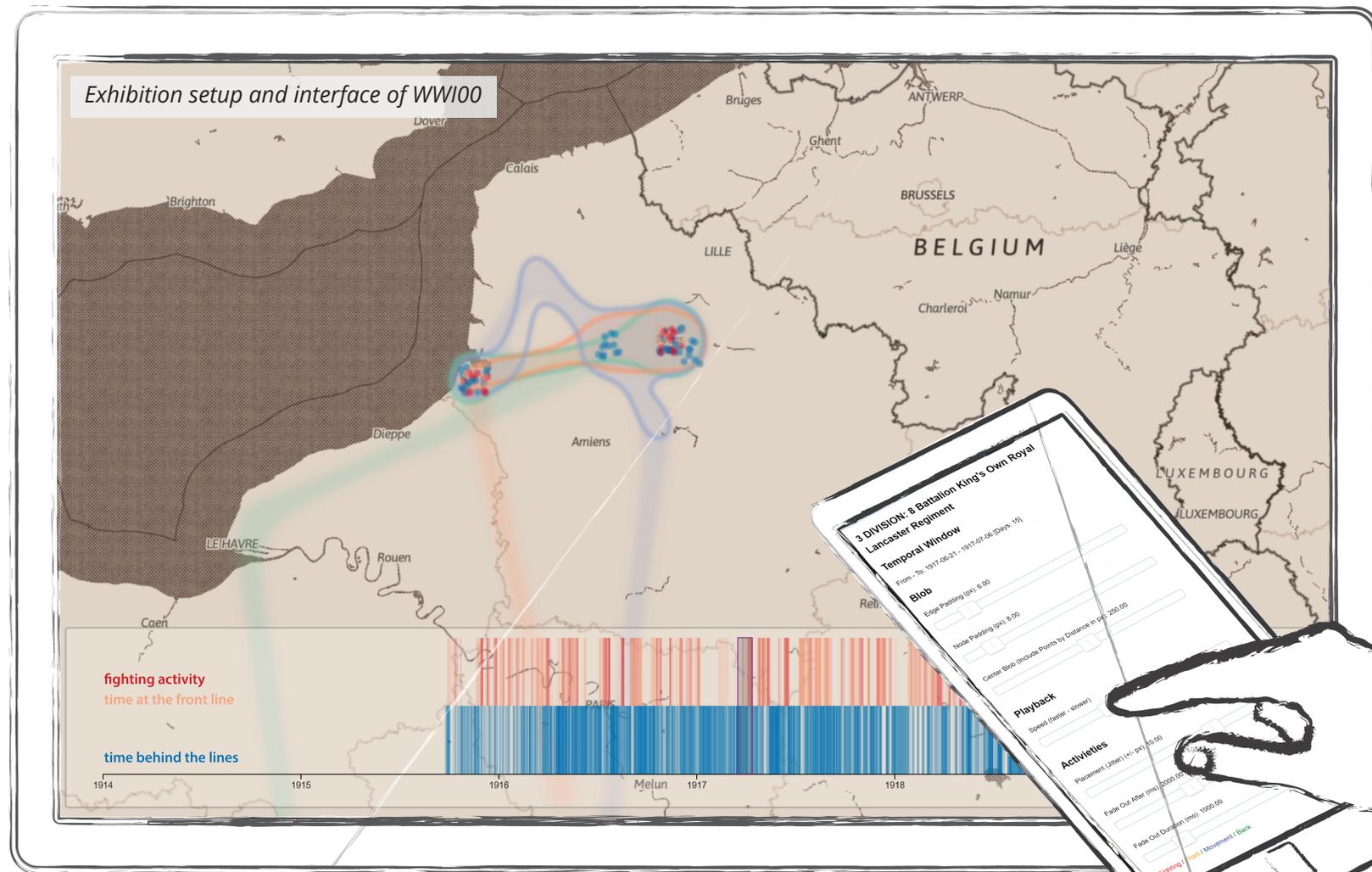
### Technical Details

The browser-based visualization uses the mapping framework leaflet [3] with custom D3 SVG overlays [4] to visualize the OWD data (spatial distribution and activities). To calculate the GeoBlobs, we make use of the Bubble Sets algorithm [5]. The custom background map was designed with Map Box Studio to convey a historical and clean aesthetics.

Currently, we are experimenting with different narrative designs [6] for enriching the visualization to provide an intriguing and more emotional experience for visitors. Amongst others, this includes text, icon, and media-based annotations of unit events and activities. We also investigate how motion can be applied to convey information (e.g., a shaking map or unit GeoBlob on fighting days).

For the exhibit setup, the visualization will play a looping animation that shows the movements and activities of several units from the 3rd division from 1914 to 1920. The selection of a single division that consists of a number of units, based on discussions with historians, is well-suited to depicting the picture of coherent military activities as a whole, where each unit is part of a bigger picture.

For a better-controlled exhibition environment, we limit the interaction to a set of sliders, which allow the visitor to



explore and vary the visualization design space to a certain degree. It includes interactive adjustment of the temporal window (how many days are visualized by a unit GeoBlob), blob properties (e.g., size), the distance from a blobs centroid to remove outlier locations forming the GeoBlob, playback speed, or duration and fade out time of events. We do not allow any map interaction or advanced temporal navigation.

Visitors interact with a tablet-sized touch screen that communicates with the

visualization projected onto a flat surface through local WebSocket.

### Installation Requirements

For the interactive WWI00 installation, we require a projector, a flat projection surface (wall or screen) and a touch interface to allow visitors to explore the visualization (e.g., tablet or a laptop, running a local host). We can provide a touch-enabled laptop. Regarding space, we would require approximately an area of 3x3 meters. Optionally, the projector can be

replaced by an appropriately sized monitor (wall mounted or on a table).

[1] OWD: <https://www.operationwardiary.org/>  
[2] Grayson: <http://research.gold.ac.uk/16713/>  
[3] Leaflet: <https://leafletjs.com/>  
[4] D3SvgOverlay: <https://github.com/teralytics/Leaflet.D3SvgOverlay>  
[5] Bubble Sets: <https://ieeexplore.ieee.org/document/5290706/>  
<https://github.com/JosuaKrause/bubblesets-js>  
[6] Henry-Riche +: [Data-Driven Storytelling, CRC Press, 2018](https://www.crcpress.com/Data-Driven-Storytelling/book9781441998441)